# Soil organic content

This is basically just a trimmed down version of the method in the Kellogg Soil Survey Laboratory Methods Manual, Soil Survey Investigations Report No. 42 Version 5.0

## Authorship

Chantal Koechli, and Nick Youngblut (2015)

## Application

The mineral content consists of the plant ash and soil particles that remain after removal of organic matter. The percentage of organic matter lost on ignition can be used to define organic soils in place of estimates of organic matter by the Walkley-Black organic C method. The determination of organic matter by loss on ignition is a taxonomic criterion for organic soil materials (Soil Survey Staff, 2014). Organic C data by Walkley-Black are generally considered invalid if organic C >8 %.

## Summary of Method

* Dry sample overnight at 110oC.
* Cool and weigh.
* Place sample in a cold muffle furnace and raise the temperature to 400oC.
* Heat sample overnight (16 h), cool, and weigh.
* The ratio of the weights (400oC/110oC) is the mineral content percentage.
* The Organic content % can be derived from the mineral content %.

## Interferences

The sample must be placed in a cold muffle furnace to prevent rapid combustion and sample splattering

## Safety

Use caution when the muffle furnace is hot. Wear protective clothing and goggles. Handle the heated material with tongs.

## Equipment

* Metal weighing tins
* Oven, 110oC
* Muffle furnace, 400oC
* Electronic Balance, 0.01-g sensitivity
* A lab notebook for recording values

## Procedure

1. Place a 10 to 15 g sample in a tared weighing tin.
2. Dry sample at 110oC overnight.
3. Remove sample from oven, cap, and cool in a desiccator.
4. When cool, record weight to nearest 0.01 g
5. Place sample and weighing tin in a cold muffle furnace. Raise temperature to 400oC. Heat overnight (16 h).
6. Remove sample from oven, cap, and cool in a desiccator.
7. When cool, record sample weight to nearest 0.01 g.

## Calculations

* + Where:
* Organic matter percent can then be calculated as follows:

# Report

Report mineral content to the nearest whole percent.

# Precision and Accuracy

Precision and accuracy data are available from the KSSL upon request.

# References

Soil Survey Staff. 2014. Keys to soil taxonomy. 12th ed. USDA-NRCS